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ABSTRACT

This paper summarizes work from a dissertation that examines the determinants of public school performance, focusing on the roles of incentives and parental involvement. The thesis presents theory and related empirics. In the theory, it analyzes the effects of competition on public school productivity, with and without parental involvement, as well as the parental involvement decision itself. In the empirical work, it measures the relative impacts of competition and collective parental pressure on school performance and the strength of interactions between them. The thesis makes three main contributions. First, it presents a conceptual framework for understanding how the sorts of incentives public schools face in practice affect school productivity. Second, the research provides empirical evidence that highlights collective parental pressure as an important determinant of school performance, as measured by achievement tests. Third, it provides estimates that cast doubt on the common presumption that greater competition will raise public-school productivity uniformly. The thesis concludes by discussing policy implications and offering a few brief thoughts about unresolved issues. (Author/WFA)

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Competition, Parental Involvement, and Public School Performance.

Robert McMillan

2001

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COMPETITION, PARENTAL INVOLVEMENT AND PUBLIC SCHOOL PERFORMANCE

Robert McMillan, University of Toronto*

IN LIGHT OF CONCERNS OVER THE LEVEL OF ACADEMIC achievement in the public school system, my thesis examines the determinants of public school performance, focusing on the roles of incentives and parental involvement. It consists of theory and related empirics. In the theory, I analyze the effects of competition on public school productivity, with and without parental involvement, as well as the parental involvement decision itself. Then, in the empirical work, I measure the relative impacts of competition and collective parental pressure on school performance, and the strength of interactions between them.

The thesis makes three main contributions. First, it presents a new conceptual framework for understanding how the sorts of incentives public schools face in practice affect school productivity. Contrary to received wisdom, the analysis shows in a variety of circumstances how greater competition from private schools may have adverse productivity consequences in public schools. Second, the research provides empirical evidence that highlights collective parental pressure as an important determinant of school performance (as measured by achievement tests), adding a new dimension to our understanding of the way that parents influence the education production process. Third, the thesis also provides estimates that cast doubt on the common presumption that greater competition will raise public school productivity uniformly. Negative interactions between competition and other disciplines on schools (notably parental pressure) help explain why competition has adverse effects on school quality in some communities, a result that has relevance for policy.

Motivation for this research comes from both policy concerns and the prior academic literature. The perceived underperformance of parts of the public school system has prompted a lively debate in policy circles about the causes of and solutions to the performance problem, generating some interesting hypotheses about the underlying workings of schools and the likely efficacy of different reform proposals. These lead naturally to issues addressed in the thesis.

It is instructive to consider one popular diagnosis of the public school performance problem. This involves the idea that school providers are acting inefficiently, and it leads to the prescription that incentives to raise quality should be strengthened, with greater reliance on the market being seen as an attractive way of doing this. Drawing on the theory of the firm, competition advocates argue that public schools enjoy excessive monopoly power and that greater competition will force them to become more efficient, raising productivity. While increased competition is likely to induce greater sorting in the school system, if productivity effects are strong enough then there is the prospect, appealing from a policy point-of-view, that "all boats will rise," with all public schools improving.

Among the reform proposals featured in the policy debate,[1] measures to reduce public school monopoly power include open-enrollment programs and private school vouchers, the latter designed to make private schools relatively more accessible, while reforms such as site-based management are intended to give parents a greater role in school governance. In the absence of large-scale experimentation, we lack a clear understanding of the probable effects of these sorts of measures or how they interact. Will they be mutually reinforcing, for example?

The prior literature offers little guidance as to the effects of changing incentives on public school conduct. In terms of theory, there has been scant research aimed at understanding how incentives influence the conduct of school providers. While the introduction of school vouchers has been analyzed in a number of insightful public finance theory papers, their focus has been on the sorting effects of vouchers, particularly in the presence of conventional peer effects (see Epple and Romano,

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1998, or Nechyba, 1998, for example). Effects on productivity have been largely neglected, even though the potential productivity benefits of vouchers figure prominently in the reform debate. The reason for this neglect may be traced to an instinctive sense that the productivity effects of vouchers are clear-cut, that vouchers must be productivity-enhancing. I show that, in a variety of circumstances, this presumption is misplaced.

Several empirical papers have explored the impact of competition on public school performance, most notably by Caroline Hoxby (1994a, 1994b). Hoxby provides striking results indicating that competition has substantial productivity effects that outweigh any adverse sorting effects. Yet the mechanisms underlying these results warrant further study. In the empirical part of the thesis, I pay careful attention to the way that competition affects public school conduct, and I also allow for the possibility that parents may be able to incentivize schools directly.

Another area of neglect in the prior literature concerns the precise role of parents in the education production process. That family background has a powerful influence on student outcomes is widely documented, but rather less is known about the channels through which family background matters. For example, how much of parental influence is genetic, and how much is due to measurable parental activities? In the thesis, I contrast parental *type* (fixed parental characteristics) and parental *actions*, noting that the latter are more likely to be amenable to change through policy. Among the variety of actions open to parents, I focus on collective action in organizations like parent-teacher associations; and I endogenize parental pressure, allowing for the possibility that it may be jointly determined with school quality.

PRELIMINARIES

Before describing the main parts of the research, several preliminary issues are worth discussing. First, the focus in the thesis is on *public school* performance, with a view to understanding how well students remaining in public school would do. The type of performance increase that is of particular interest to policymakers involves school quality rising without any additional resources being committed–an increase in *productivity*.[2] Gaining a better understanding of the determinants of school productivity is one of the main goals of the thesis.

Both in the theory and the empirical work, I allow for the possibility that the interests of parents and schools do not coincide entirely, bringing incentive issues to the fore. This is in contrast with much work in the education literature, which treats schools as an efficient technology for converting inputs into student outputs, or equivalently as maximizing quality. Based on anecdote and empirical evidence, allowing some degree of conflict seems reasonable.[3] While a school can direct effort to producing the type of quality that parents demand, doing so is assumed to be either directly costly or to entail sacrificing other desirable things, so that the school will not automatically devote all its effort to producing what parents want.

The extent to which interests are misaligned may vary substantially across communities, as may the ability of schools to pursue a different agenda. An important task in this work is to understand how the types of incentives faced by schools in practice influence the amount of effort the school directs toward the ends valued by parents (taken to be raising quality in the theory and raising test scores in the empirical work). Under the existing system, formal incentives are typically flat: teachers have tenure after a relatively short interval of time, schools infrequently "go out of business," and rarely is performance linked to pay, either individually or at the school level. In practice, parents have several means of influencing school conduct: they may vote, affecting school finance or the composition of school boards; they may apply direct pressure on school personnel, either individually or collectively through parent-teacher organizations; and they may exit to private school. This thesis focuses on the latter two, with pressures from competition and parental involvement being allowed to influence the school effort allocation problem.[4]

I now review the theory and empirical chapters in my dissertation in more detail.

THEORY

The theory focuses on circumstances in which competition might be expected to have most benefit, namely when suppliers (in this case, public schools) are rent-seeking.[5] Two questions are addressed: first, in the case where competition from private schools is the only discipline on rent-seeking public schools, will greater competition always raise school productivity? Second, in the

presence of other preexisting disciplines (in particular, collective parental pressure), will competition always be productivity-enhancing? In each case, the productivity effects of competition will be found to be ambiguous: in some circumstances, competition raises productivity, in others it lowers it. And recall that we are abstracting from sorting effects: to the extent that greater competition induces more sorting between public and private sectors and conventional peer effects are strong, so any adverse effects of competition are likely to be reinforced.

Externalities and Perverse Productivity Outcomes

Greater competition will mean typically that suppliers have to raise quality to keep students enrolled given that their outside options improve. In a world in which suppliers raise quality by becoming more productive, I show that the notion that competition must enhance productivity does not hold uniformly.

In the first theory chapter (revised as McMillan, 1998), I prove a general result that in the presence of externalities, increasing competition makes it optimal for public schools to lower productivity in some communities. I show that the type of externality needed for this to occur is more basic than the standard form of peer effect, whereby students of different abilities influence the learning process of others. All that is required is that different types of households have different demands for schooling quality, but that within a given school, raising the quality supplied to one student raises the quality supplied to others to some degree–in other words, students are not completely tracked.

To make things clearer, suppose there are two types of households–low and high income–being otherwise the same. Households care about school quality, in addition to consumption, and they choose between public and private school (the latter charging tuition), based on the quality and cost of each. Public schools are assumed to be single effort-making bodies, higher effort leading to higher public school quality. If a public school sets effort high, both low- and high-income households choose to enroll there; if it supplies low effort, just low-income households enroll. In choosing its effort level, the public school faces a trade-off: high effort brings high enrollment and high revenues (where each additional child brings in a given amount of dollars), but high effort is costly. I show that public schools are more likely to supply high effort (and thus quality) as the proportion of high-income households in the community rises and as the income levels of the two types of household become closer. And in terms of the demand externality, if the public school tries to win the whole market, then the children of low-income households receive more than their reservation quality, assuming there is no tracking.

In this simple setup, it is possible to identify a range of communities in which it pays public schools to win the entire market before a private school voucher has been introduced. But post-voucher, the cost of maintaining enrollment becomes too high, either because there are insufficient high-income households in the community, or because low- and-high income households are very dissimilar, in which case public schools choose to reduce effort and serve just the low-income types. The point to emphasize here is that it is *not* automatic that public schools must try to retain market share when a voucher is introduced. In some cases, it may be in their interests to let enrollment decline, thereby saving on the effort cost.

The analysis shows how the main result is sensitive to the degree of tracking in schools and the design of the voucher–whether it is targeted or not. If the voucher is targeted at low-income households, the perverse result goes away. The results are relevant empirically: it is straightforward to show that the effects of a private school voucher on public school productivity are likely to be non-uniform, according to the characteristics of households and the community. Further, increased competition *may* reduce productivity. Both findings are worth investigating (see McMillan, 2000a, for evidence).

Combining Competition and Parental Pressure

If public schools underperform, parents have the option of becoming more involved. They can spend more time helping their children in the home, they can provide the school with more resources, or they can complain directly in a bid to improve quality–what Hirschman (1970) termed "voice." This voice channel–applying pressure on school providers–provides an alternative to "exiting" to private school (or, indeed, to other public schools).

Building on Hirschman's insightful discussion, the key contribution in the second theory chapter is to draw attention to the importance of interactions between competition and preexisting disciplines on schools, such as collective parental pressure. In particular, once we allow both paren-

tal pressure and competition to influence school conduct, the productivity impact of greater competition depends on whether parental pressure is reinforced or undermined by greater competition. In plausible circumstances, greater competition can undermine parental pressure–for instance, if the vocal active parents are the ones who exit first. Theory cannot determine which version of the "voice-exit" interaction holds, which calls for careful empirical work.

The analysis also identifies a new source of peer effects working through parental actions. By applying collective pressure on school providers, parents are able to force schools to increase productivity. And to the extent that school quality is non-excludable, applying parental pressure has the character of a privately-provided public good. I model the individual choice process explicitly, whereby parents decide how much pressure to apply, drawing attention to the inter-dependency among parental contribution choices. As free-riding will tend to lead to underprovision of the "parental pressure" public good, this creates a role for organizations like parent-teacher organizations, helping to sustain cooperation among parents. Such organizations also help coordinate collective parental behavior, necessary when multiple equilibria in the parental contributions game arise.

EMPIRICAL WORK

Prompted by the theory, four questions are addressed in the empirical work.

1. What determines the level of parental involvement in collective organizations, such as school PTAs? Is such involvement influenced by market conditions (including the degree of competition from private schools) and the performance of the public school itself?
2. Does collective parental pressure have an effect on the education production process? Here, I allow for the possibility that there is reverse causation, from school performance to the involvement of parents.
3. Does competition have an effect on public school performance, and how does its effect compare with that of parental pressure? The *relative* impacts of the two have not been measured in the prior literature.
4. Fourth, does greater competition undermine or reinforce the impact of parental pressure, and are the interactions strong?

To address these questions, I develop an empirical model that captures the interactions among public school quality setting, parental pressure, and private school enrollment (see McMillan, 2000a, 2000b, for more recent evidence). From the model, I derive a system of three equations that I estimate, making use of an extensive new data set, using three-stage least squares. The primary data source in the analysis, the restricted access version of the National Education Longitudinal Study of 1988, provides detailed information on a nationally representative sample of schools, including measures of performance on standardized tests, and the characteristics and actions of parents whose children attend those schools. In the restricted access version, public schools can be linked to their school district, allowing measures of local market conditions to be constructed.

In terms of the key variables used in the empirical analysis, collective parental pressure is measured by the proportion of parents sampled from each public school who are active in the PTA. (On average, around 23 students and their parents are sampled from each school, the proportion who say they are active in the school PTA being 0.2.) In the light of the endogeneity concern–that worse public schools call forth more parental pressure–I use an instrumental variables strategy when trying to gauge the effects of parental pressure on school performance (as measured by school average test scores); otherwise, one would expect the estimates of parental pressure to be biased downward. The instrument I choose for active PTA participation is a variable that measures the proportion of parents who say they are active in "other" organizations, such as church or neighborhood organizations. This variable has the desirable feature that it is a strong predictor of active PTA participation, but there is little reason to think that it belongs in the school performance equation directly, as it relates to non-school organizations and I control for a host of other relevant factors directly.

The data set does not contain any information about private school vouchers or policy levers that might be expected to change the degree of competition from private schools in an exogenous way. It does include information about private school

availability in the vicinity of each public school, in particular, private school enrollment in the surrounding district. The difficulty with using this measure is that private school enrollment share is likely to depend in part on public school performance. To capture changes in private school availability that are exogenous to public school performance, I use instruments based on county demographic variables. The idea is as follows: unlike public schools in my data, private schools are able to enroll students from outside a given school district. Thus, to the extent that private school students cross district boundaries, so the demographics of the county (such as the median household income and racial composition) should help predict private school enrollment within a given *district*–first-stage estimates indicate that this is indeed the case. At the same time, in the public school performance equation, I control for a host of *district* demographic variables on the grounds that these are more likely than the corresponding county variables to influence the behavior of a public school found in that district. The identification strategy thus draws on differences in district and county demographic variables.[6]

Estimates of the system indicate that once the decision of parents to be involved in school affairs becomes endogenous, parental pressure has a positive and significant effect on public school performance, controlling carefully for parental and community characteristics. From the reduced form, doubling the proportion of parents active in other organizations would raise school average reading scores by around 1.5 percent. In contrast, stronger competition from private schools has a negative or insignificant effect on student achievement across a wide variety of specifications, a finding that casts doubt on the view that positive productivity effect of competition on public schools will overwhelm all other effects. Furthermore, stronger competition appears to weaken the positive impact of parental pressure on school productivity, indicating that pressure and competition are substitutes in the education production process: in communities where parental involvement is high, greater competition undermines the marginal impact of parental pressure. This negative interaction between competition and parental pressure is consistent with a compositional effect whereby the more vocal, active parents are the first to switch to private schools when the latter become more easily accessible.

CONCLUSION

I conclude by discussing policy implications and offering a few brief thoughts about unresolved issues.

Conceptually, there are clear reasons why increased competition might have non-uniform effects on public school productivity, and in some communities, why productivity is likely to *fall*. The empirical evidence in the thesis indicates that the overall effect of competition is close to zero, but to the extent that this includes negative effects in some communities, it argues for using the competition instrument selectively, as with targeted vouchers, for instance. (Non-uniform effects of competition are examined in more detail in McMillan, 2000a.)

In some communities, moves to increase competition may undermine preexisting pressures to maintain quality. The theory indicates that if competition and parental pressure are substitutes in the education production process, then competition is more likely to have positive effects on school quality where parental pressure is weak, typically in lower income communities. The empirical work supports the view that substitute relations do obtain. On the basis of this evidence, targeting vouchers seems preferable. There may still be a role for competition where there is no other "game in town"–where parents are inactive and where they have no outside options. But just how much competition will affect school performance in the circumstances in that it will have most effect requires further investigation.

The work in this thesis has shed little light on the underlying causes of variation in school performance and school productivity. The theory invoked the rent-seeking hypothesis (and the idea that schools underperform because they pursue an easy life) largely because it served a useful purpose, to dramatize the results. Even if the worst possible assumptions about the motivation of school personnel are made, the analysis showed how discipline of the market would not necessarily improve matters; perverse incentive effects may arise. As a description of what goes wrong in schools in practice, the rent-seeking hypothesis is unlikely to be appropriate in all cases. One way to shed light in this highly charged area involves paying close attention to possible constraints faced by schools that may divert attention away from pursuing what seem to be obviously worthwhile causes, for instance, raising student achievement. Related to this, a bet-

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ter understanding of public school decisions requires more attention to the multiple objectives they seem to pursue. Also worthy of study are the implications of sorting between public and private school, the subject of ongoing research in McMillan (2000a).

Notes

[1] Recently, a number of states adopted accountability programs that reward schools based on their measured performance. Because the data used in the empirical analysis come from the late 1980s, prior to these reforms, the thesis focuses on incentives from other sources.

[2] In the theory chapters, school productivity will be taken to increase when the effort of school personnel rises, leading to an increase in school "quality"; in the empirical work, productivity will be taken to increase when school average test scores rise, controlling carefully for school inputs.

[3] In the data used for the empirical chapter, there are measures of the extent to which parental and school interests are aligned, indicating a clear divergence between parents' interests (on average) and those of the school.

[4] Parents also have the option of moving house, switching to another public school; my analysis conditions on household residential location. See Bayer (1998) for an empirical analysis that allows households to choose both place of residence and school at the same time.

[5] The rent-seeking assumption is made not because of its realism but in order to "stack the deck" in favor of competition having positive productivity effects. Results to the contrary will then tend to be more compelling.

[6] In some states, school districts and counties coincide, but this is the case for a relatively small proportion of the public schools in the sample.

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